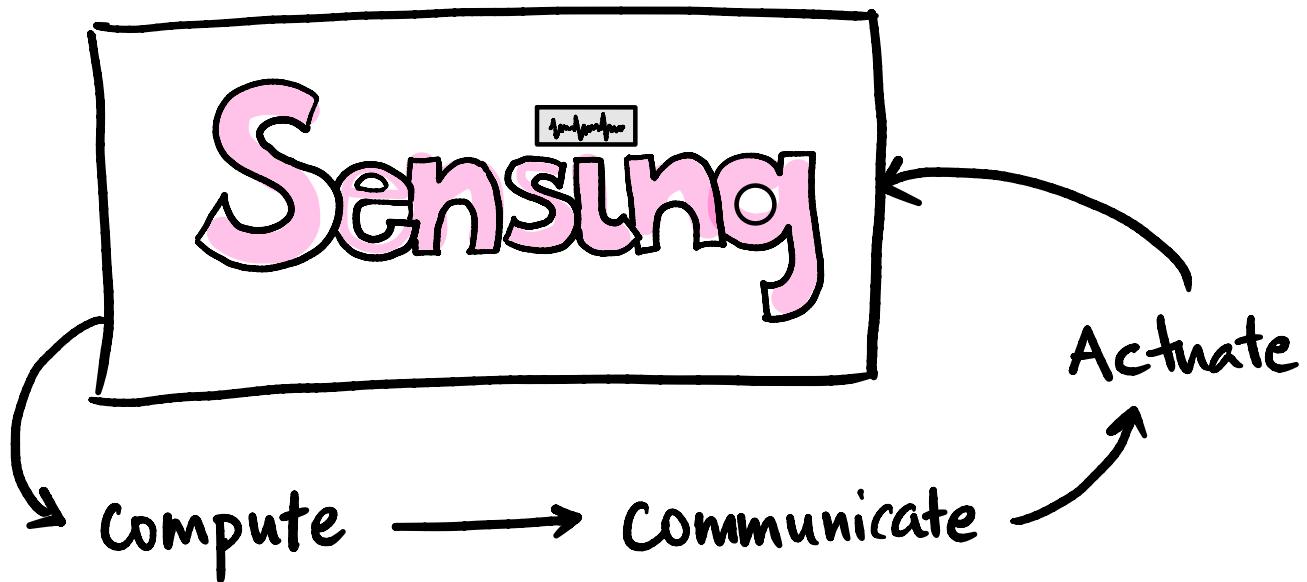
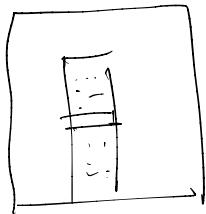


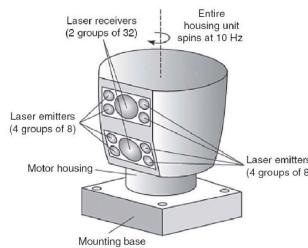
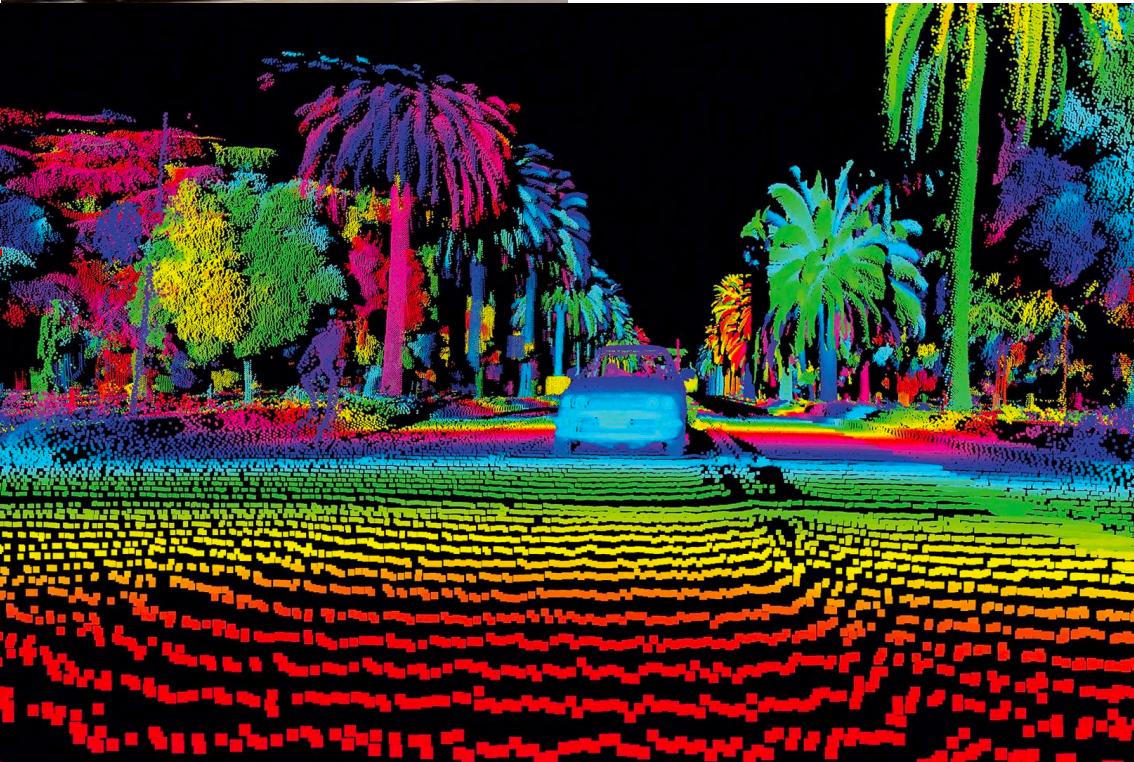
Part 3

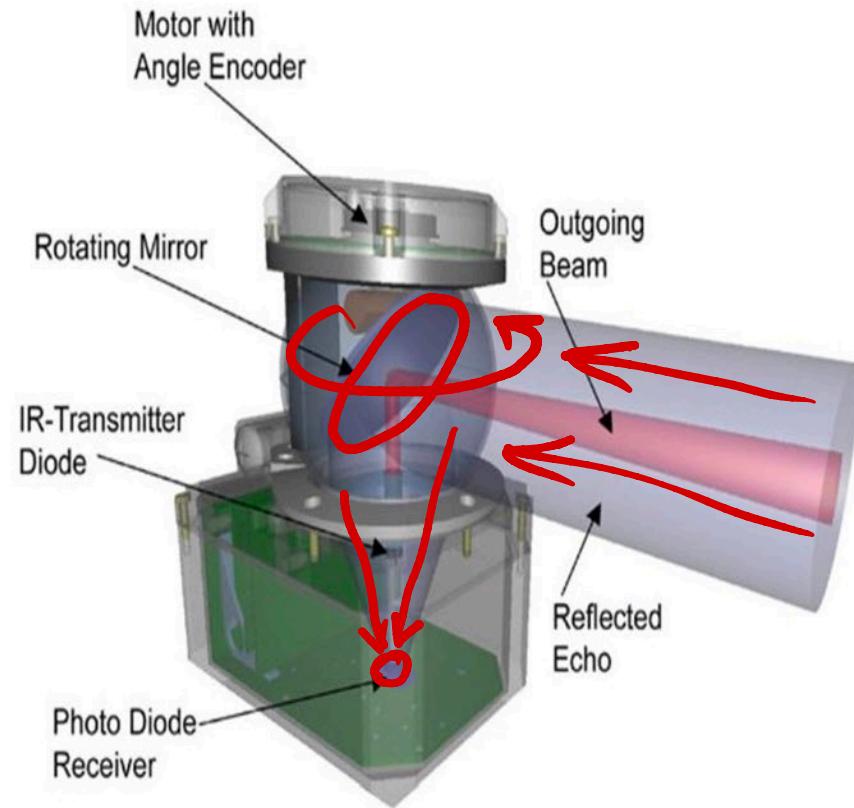
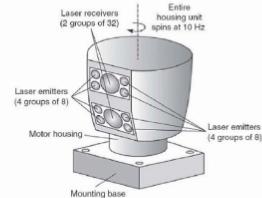


LIDAR



3D
Point
Cloud



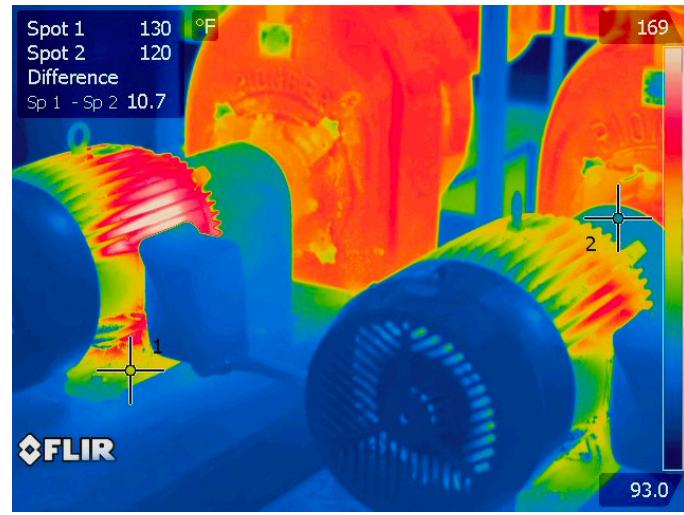


Infra Red Camera



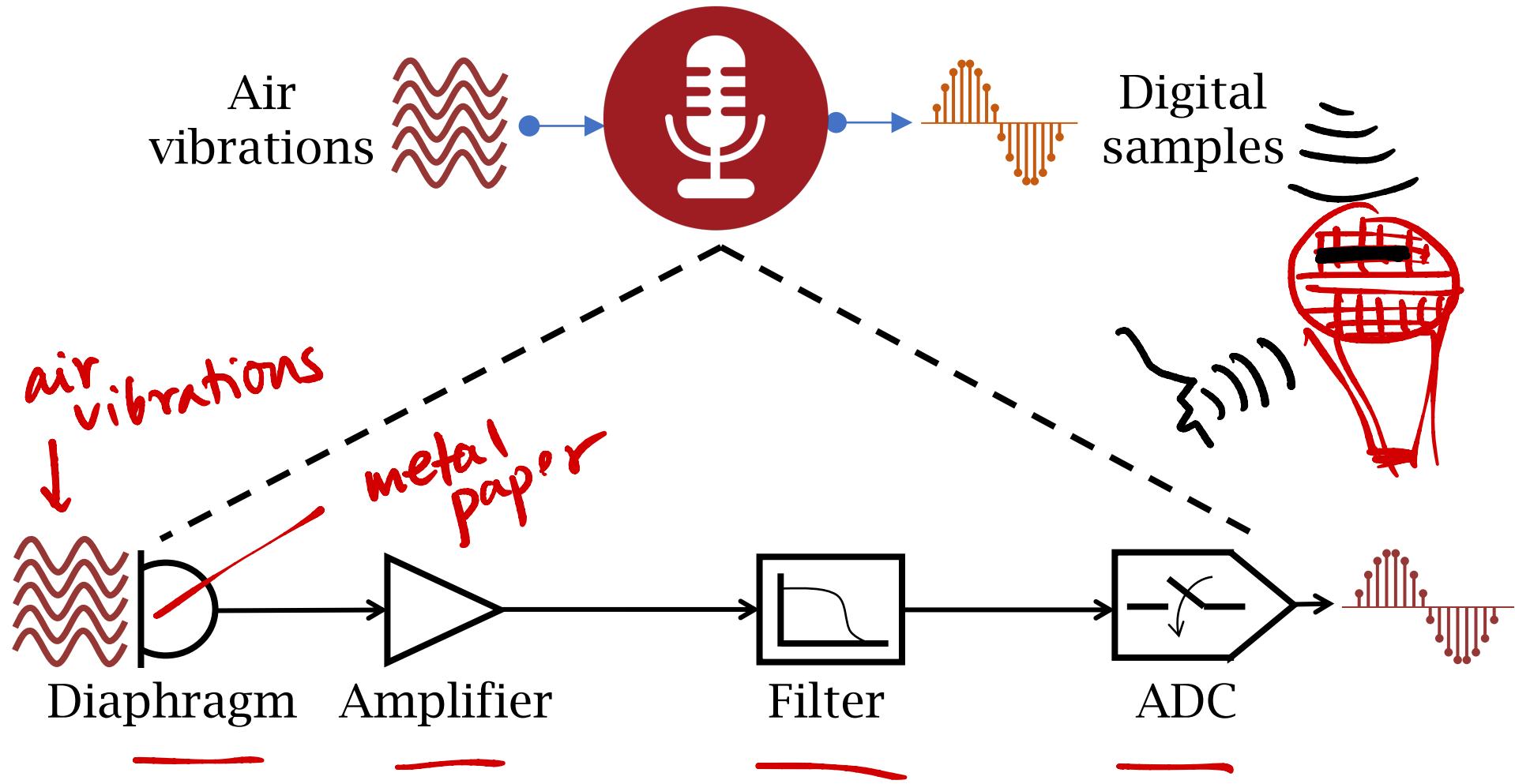
! freq

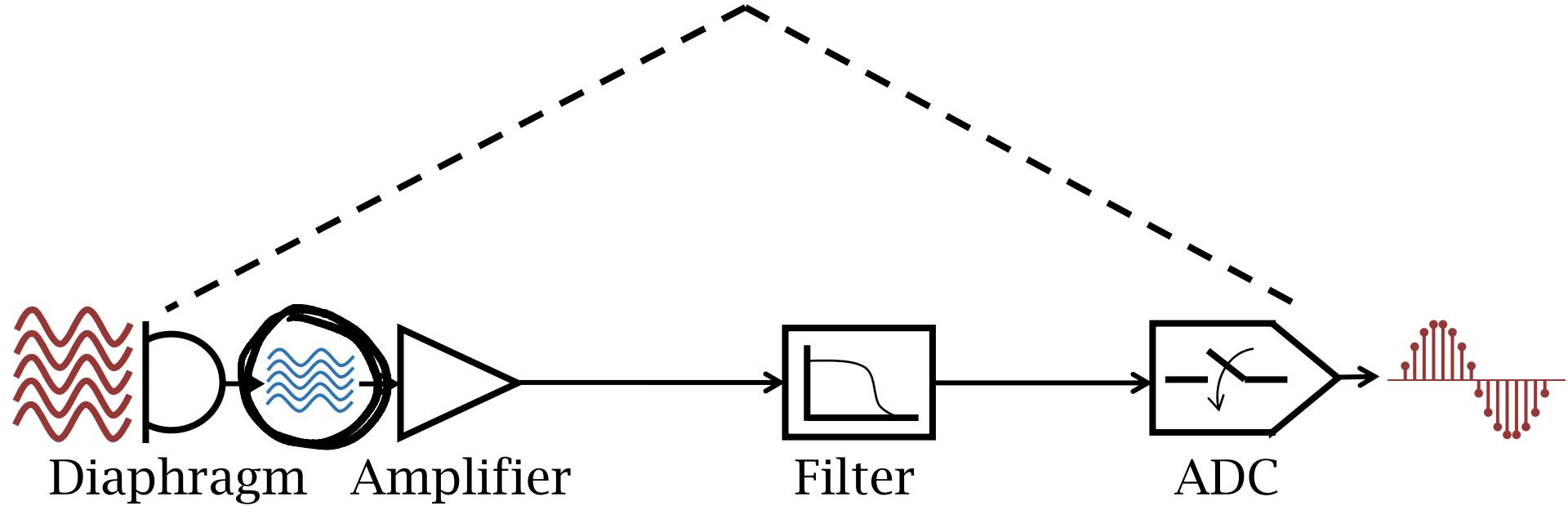
A hand-drawn diagram in red ink shows a wavy line labeled 'freq' pointing towards the infrared camera. A vertical wavy line labeled 'freq' is also shown, with a red arrow pointing from it to the camera's screen.

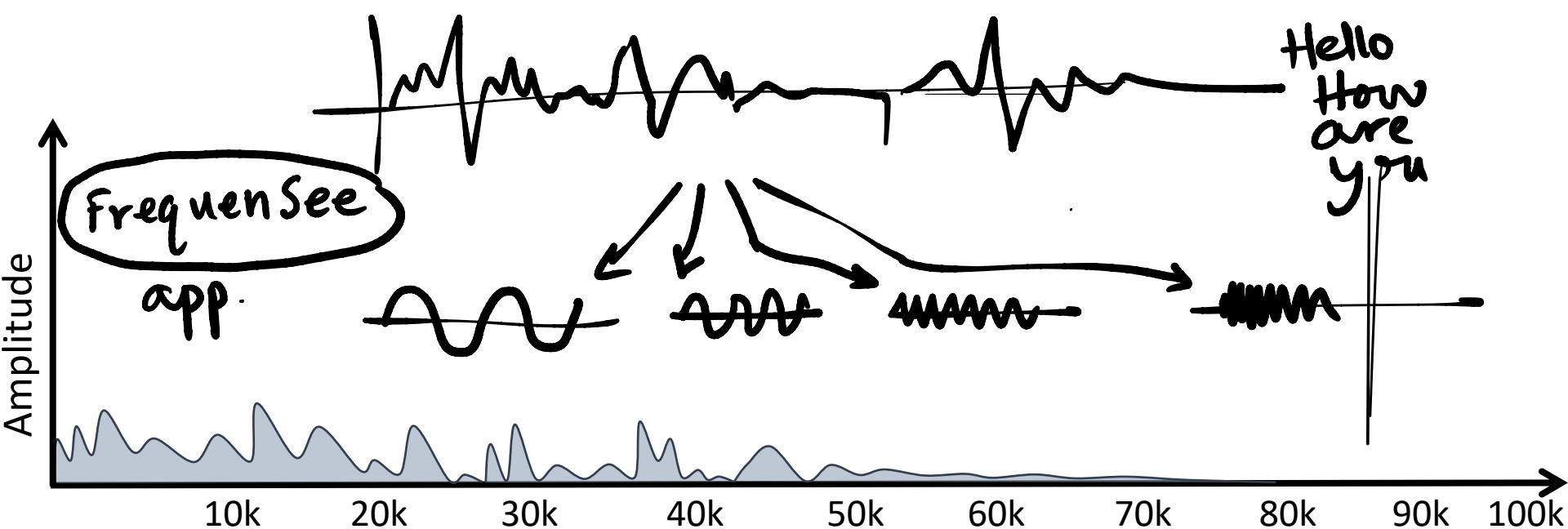


Microphone → transducer

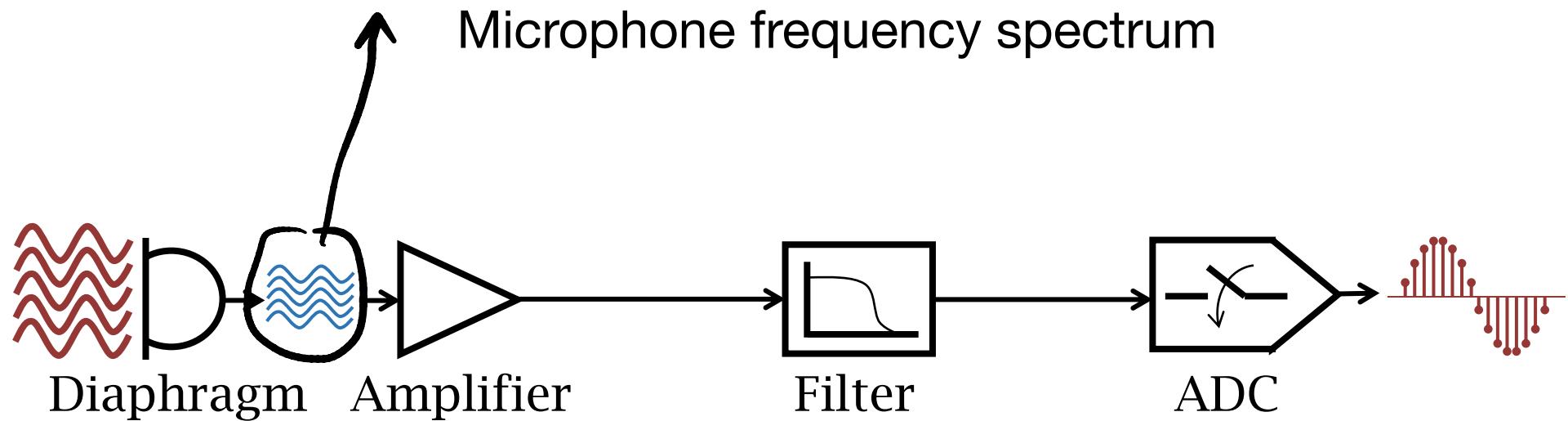


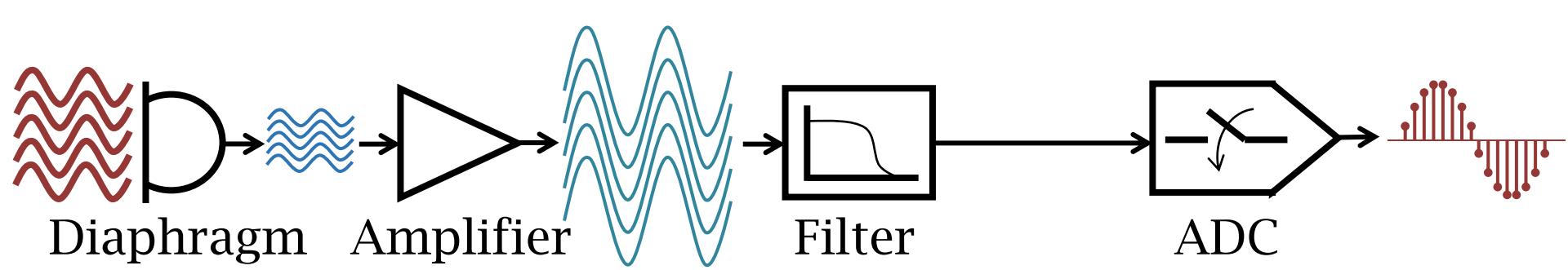
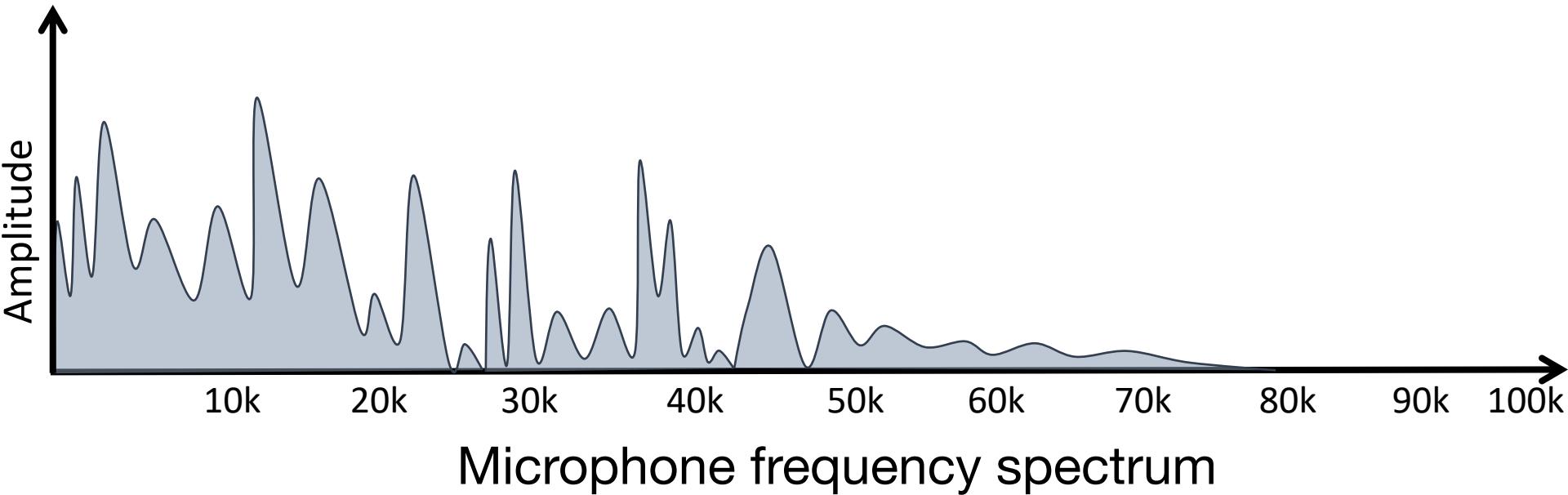


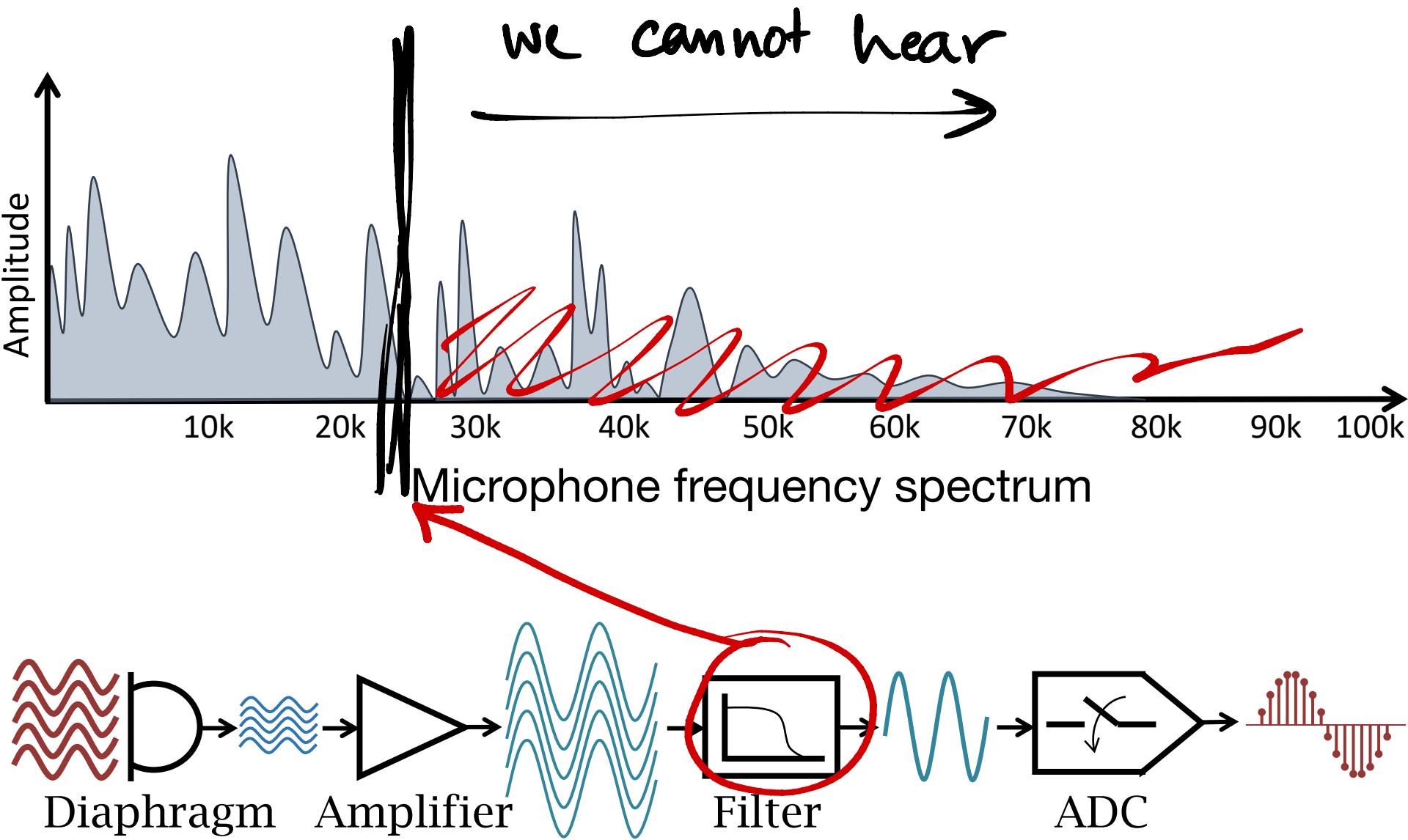


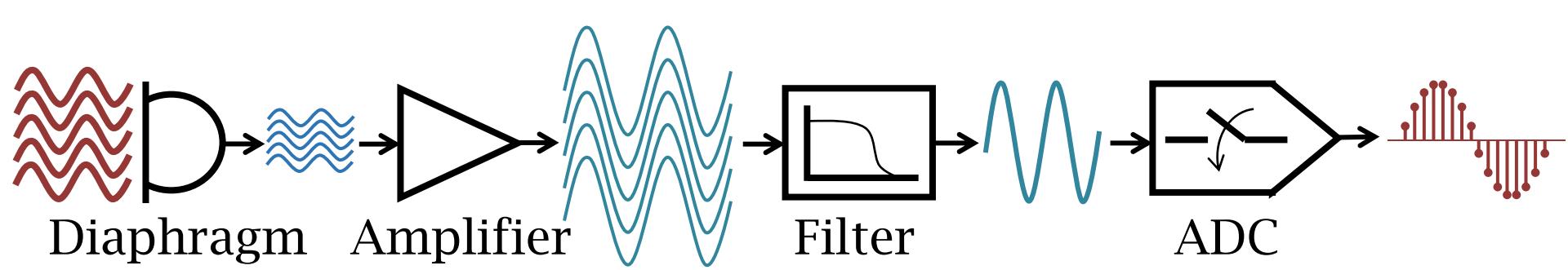
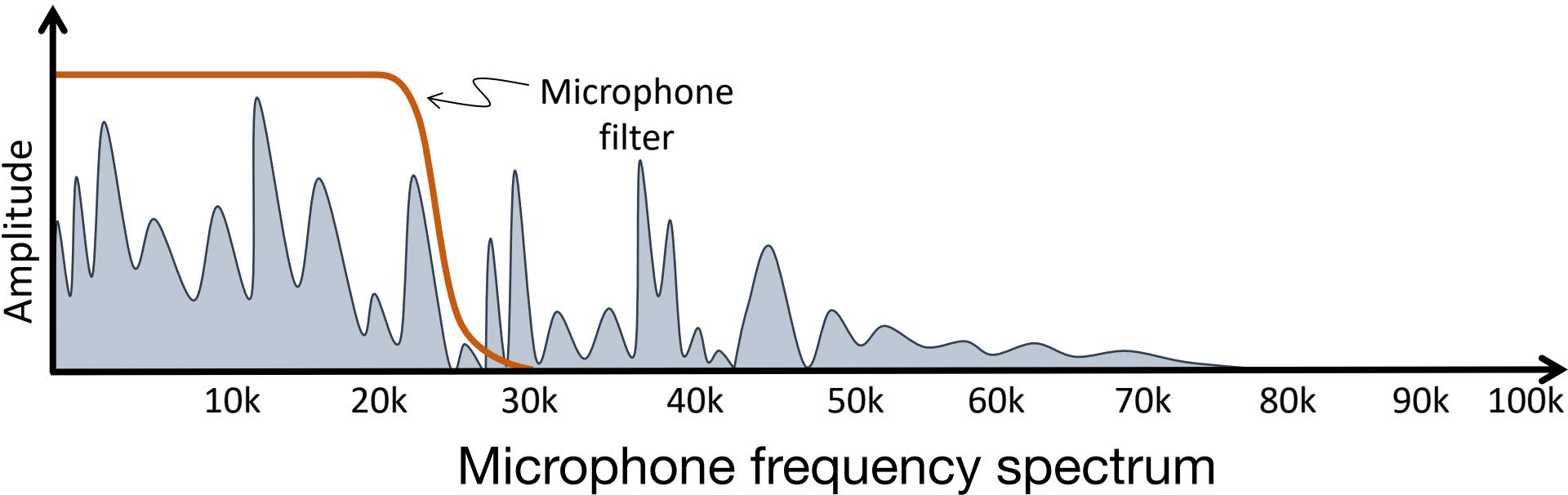


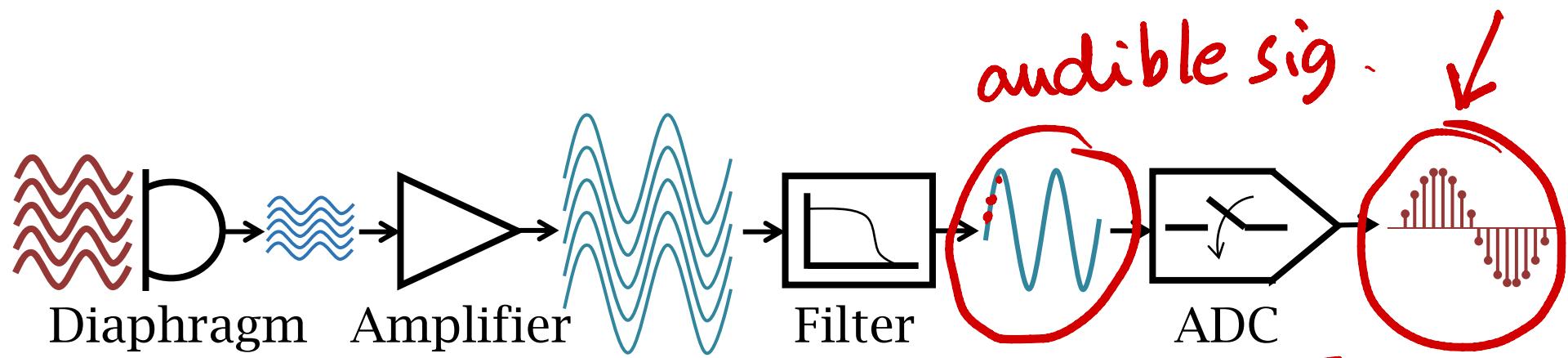
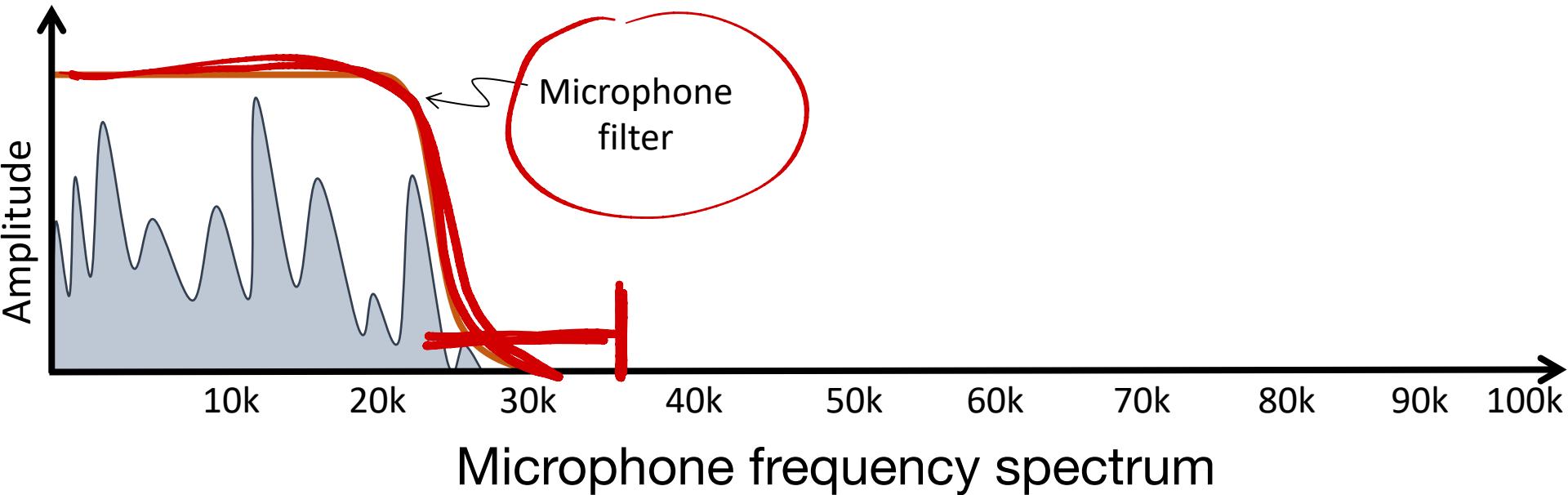
Microphone frequency spectrum





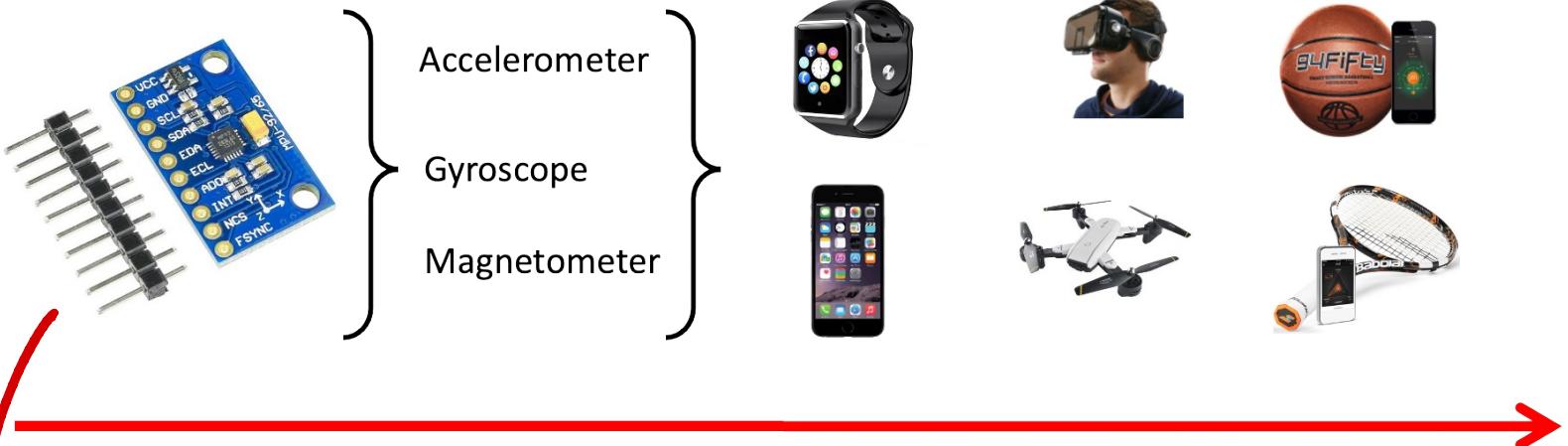






Analog to
Digital converter

Motion Sensing (IMU) → Inertial measurement unit

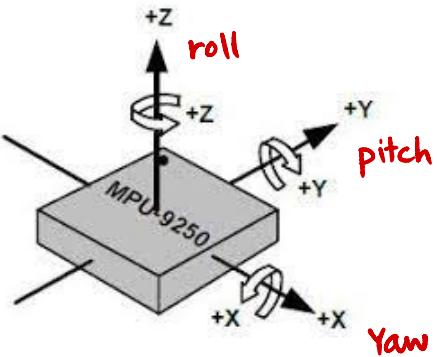


Wide applications in motion tracking

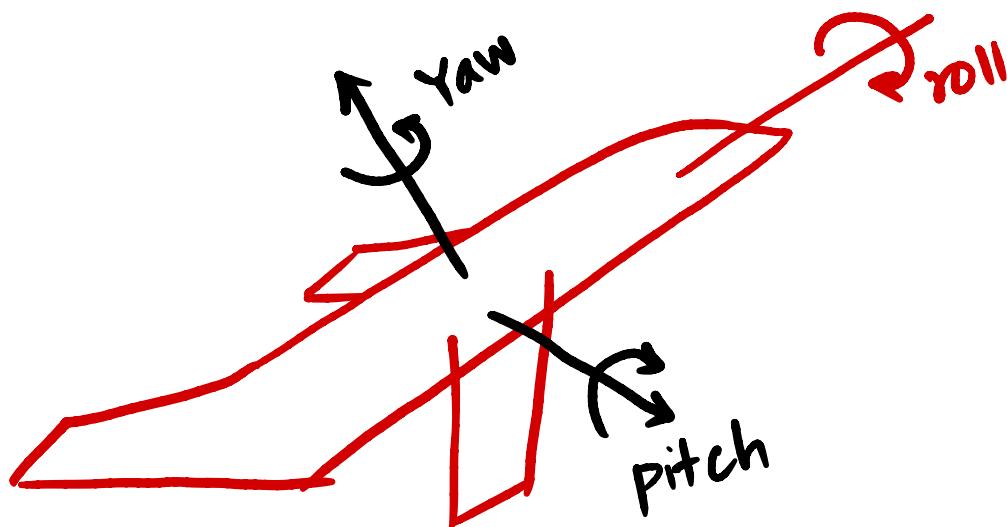
3 sensors :

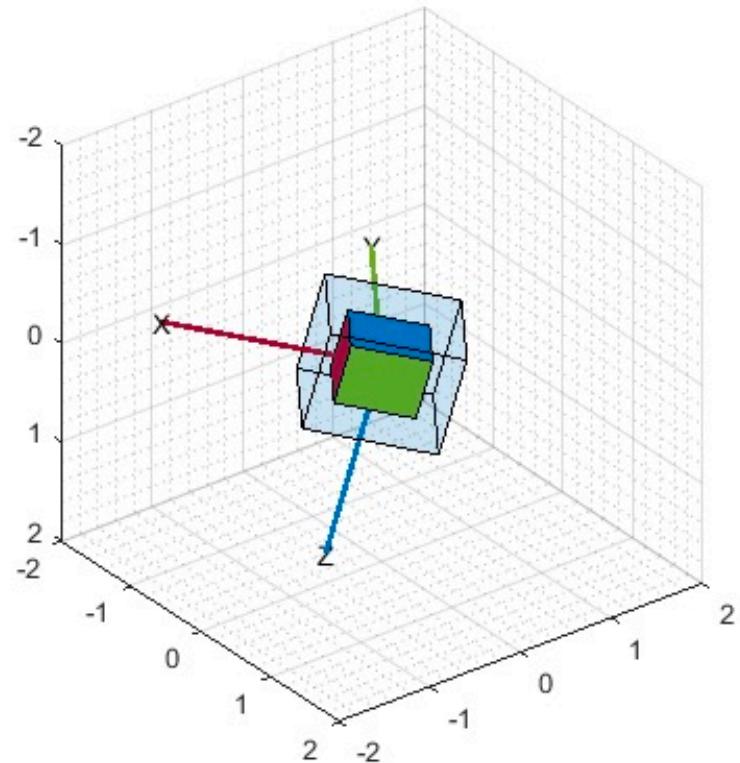
accelerometer

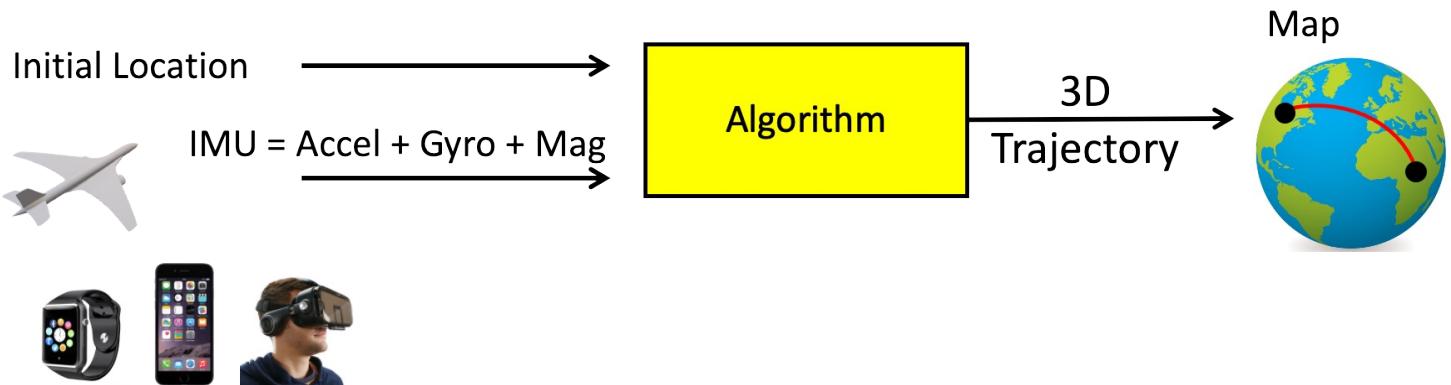
gyroscope magnetometer



<https://youtu.be/6ijArKE8vKU>







Zoom into IMU data:

$$\text{Accel.} = \begin{bmatrix} a_x \\ a_y \\ a_z \end{bmatrix}$$

(Linear Acceleration)

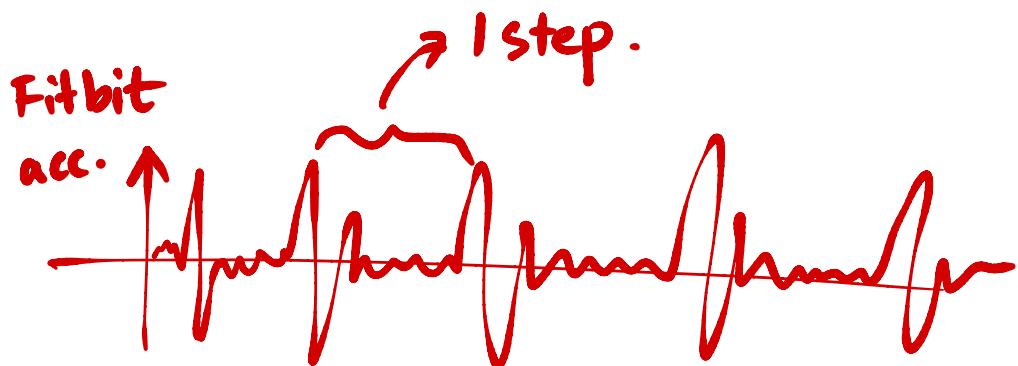
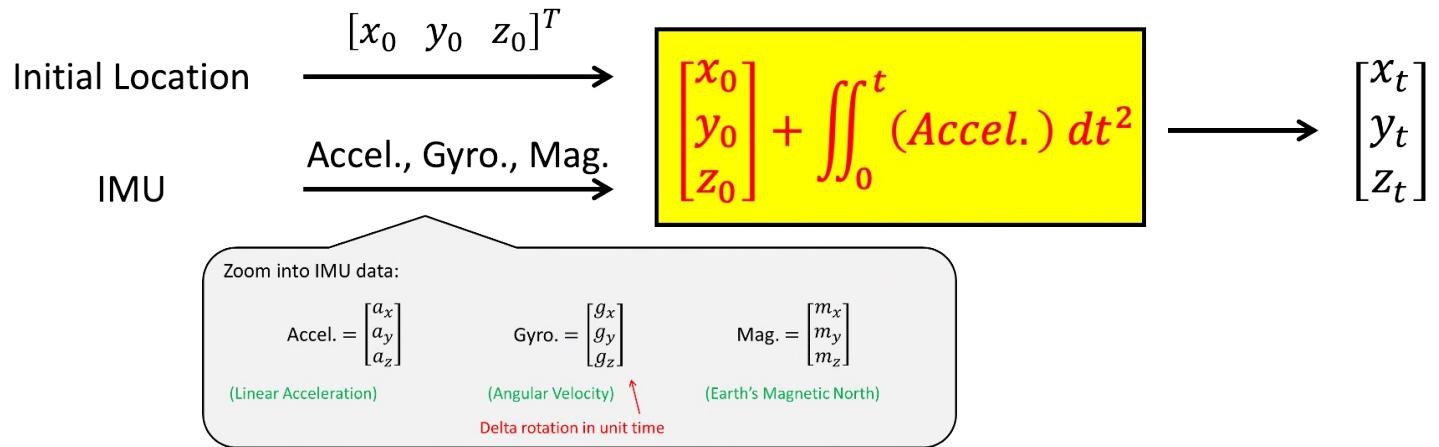
$$\text{Gyro.} = \begin{bmatrix} g_x \\ g_y \\ g_z \end{bmatrix}$$

(Angular Velocity)

$$\text{Mag.} = \begin{bmatrix} m_x \\ m_y \\ m_z \end{bmatrix}$$

(Earth's Magnetic North)

Delta rotation in unit time





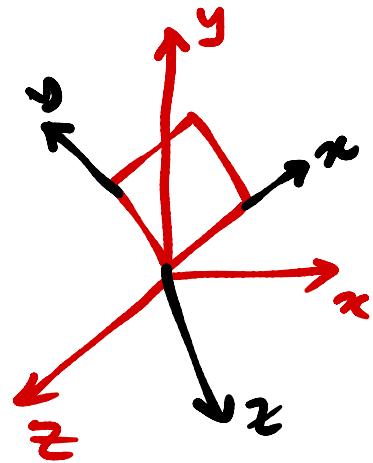
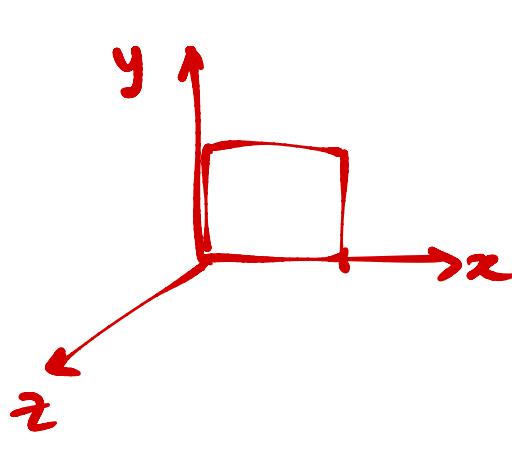
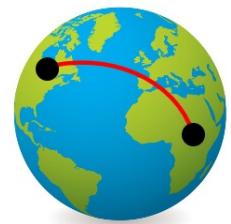
New Delhi Airport

Accelerating
 a_x : Frontwards
 a_y : Rightwards
 a_z : Upwards

What is
- Frontwards
- Rightwards
- Upwards
w.r.t. the earth?

3D
Trajectory

Map

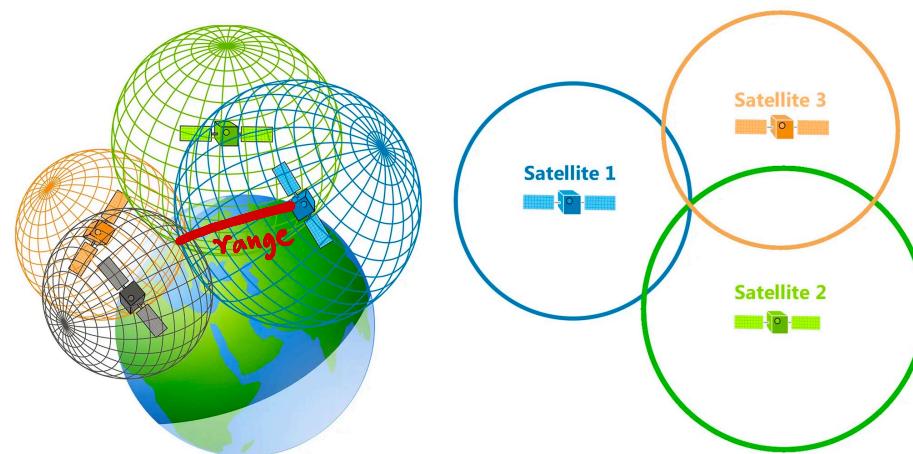


Wireless

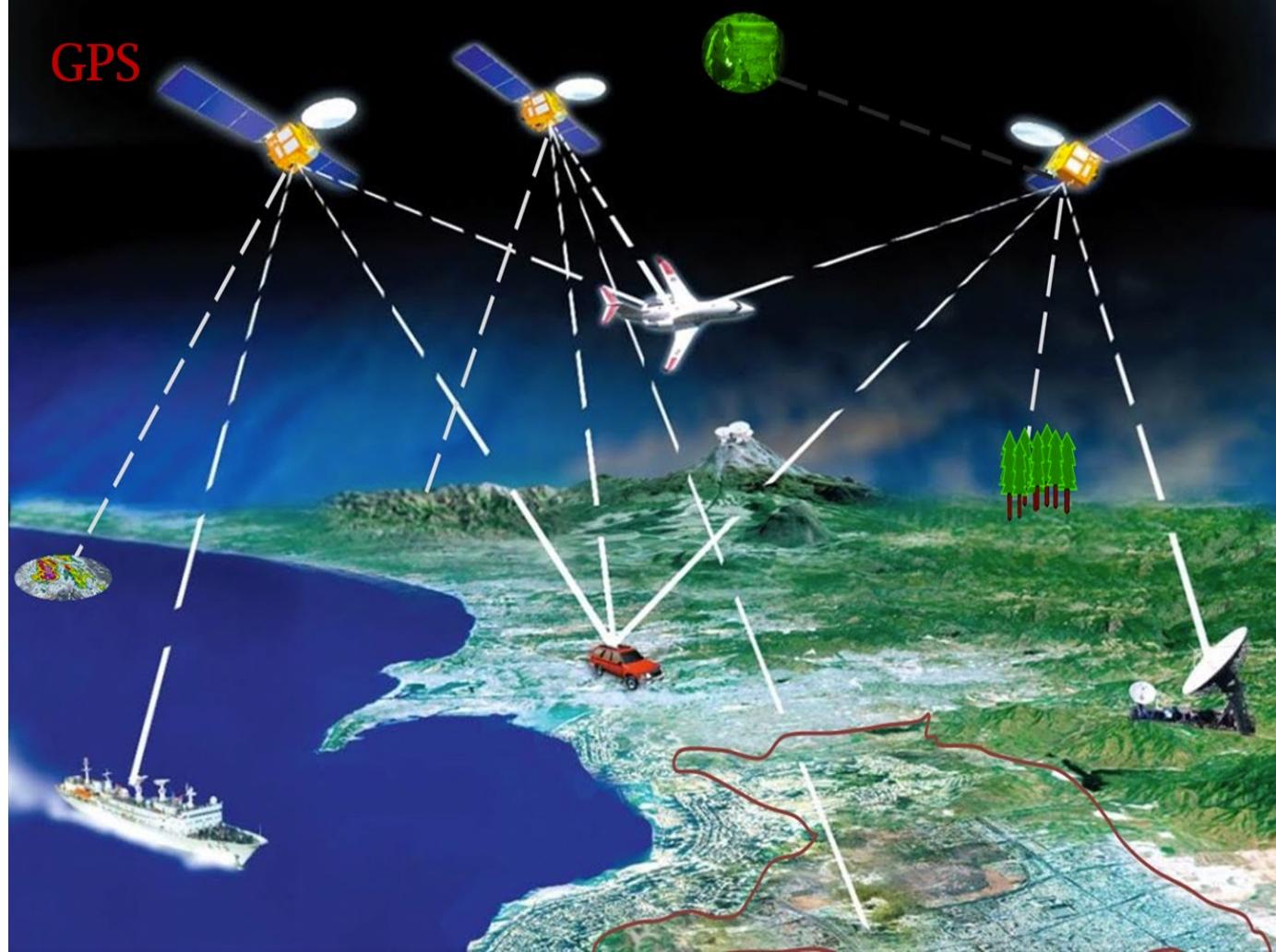
GPS

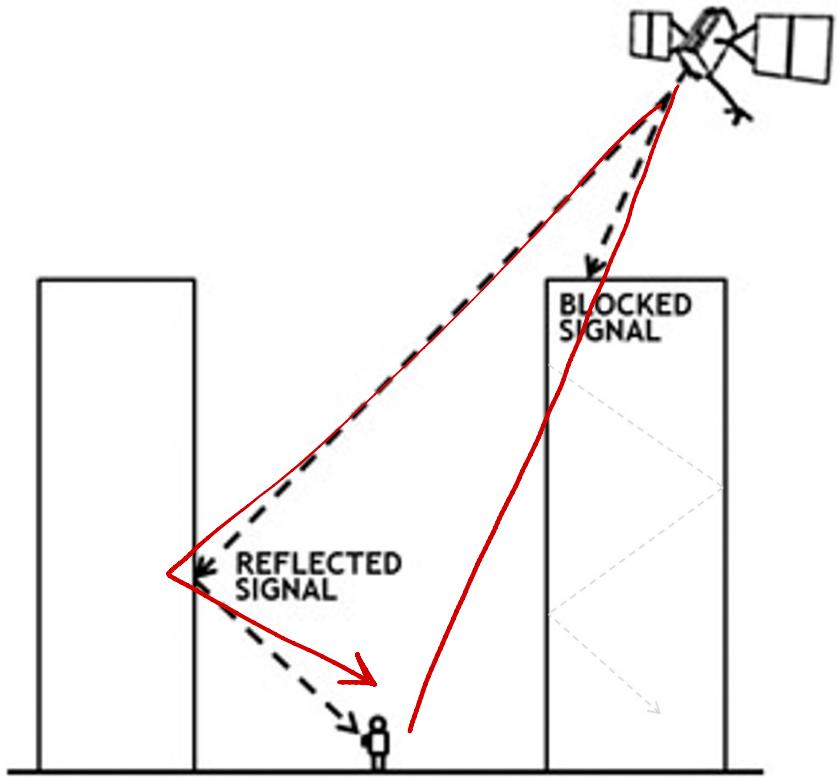


Trilateration

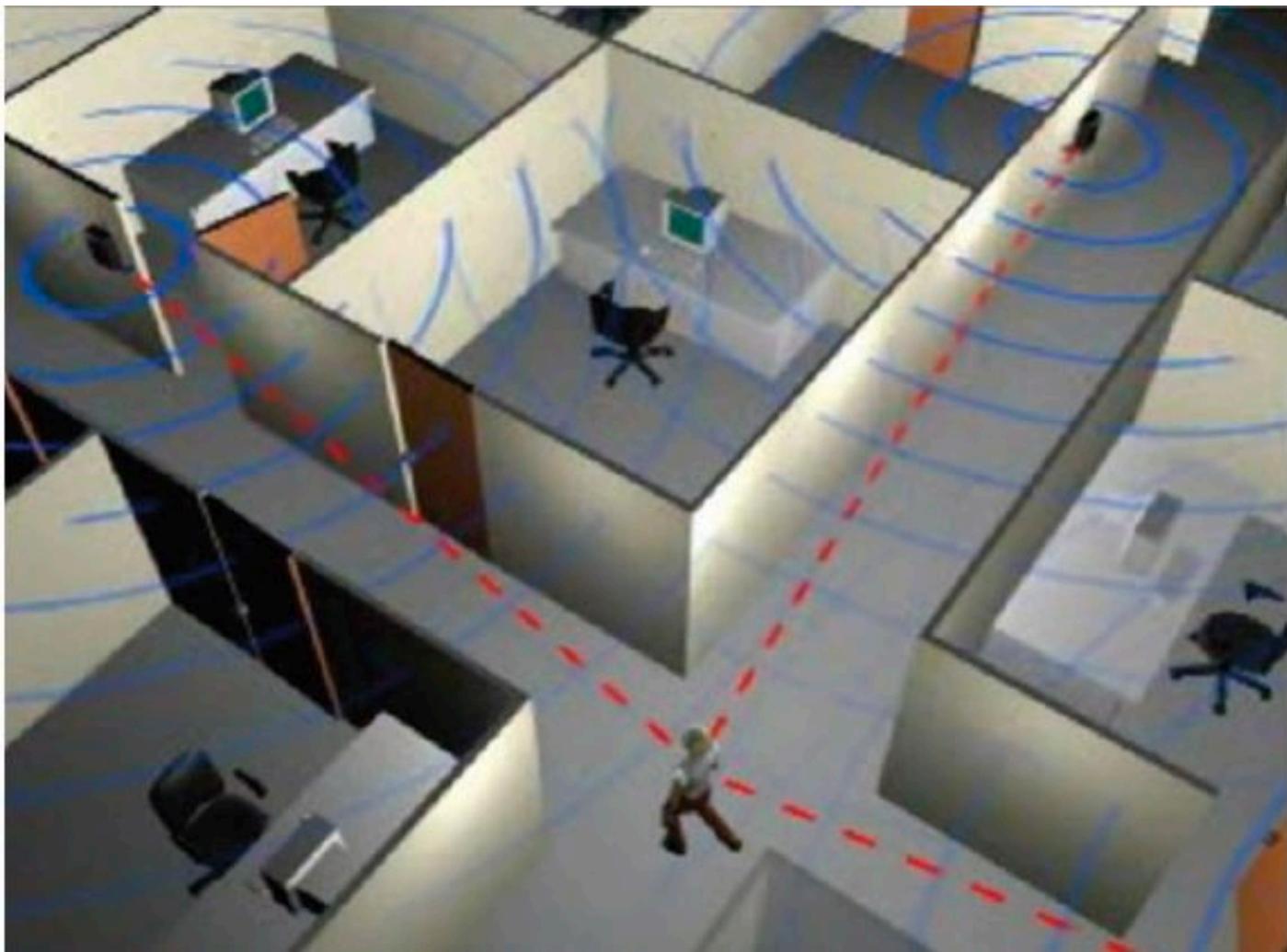


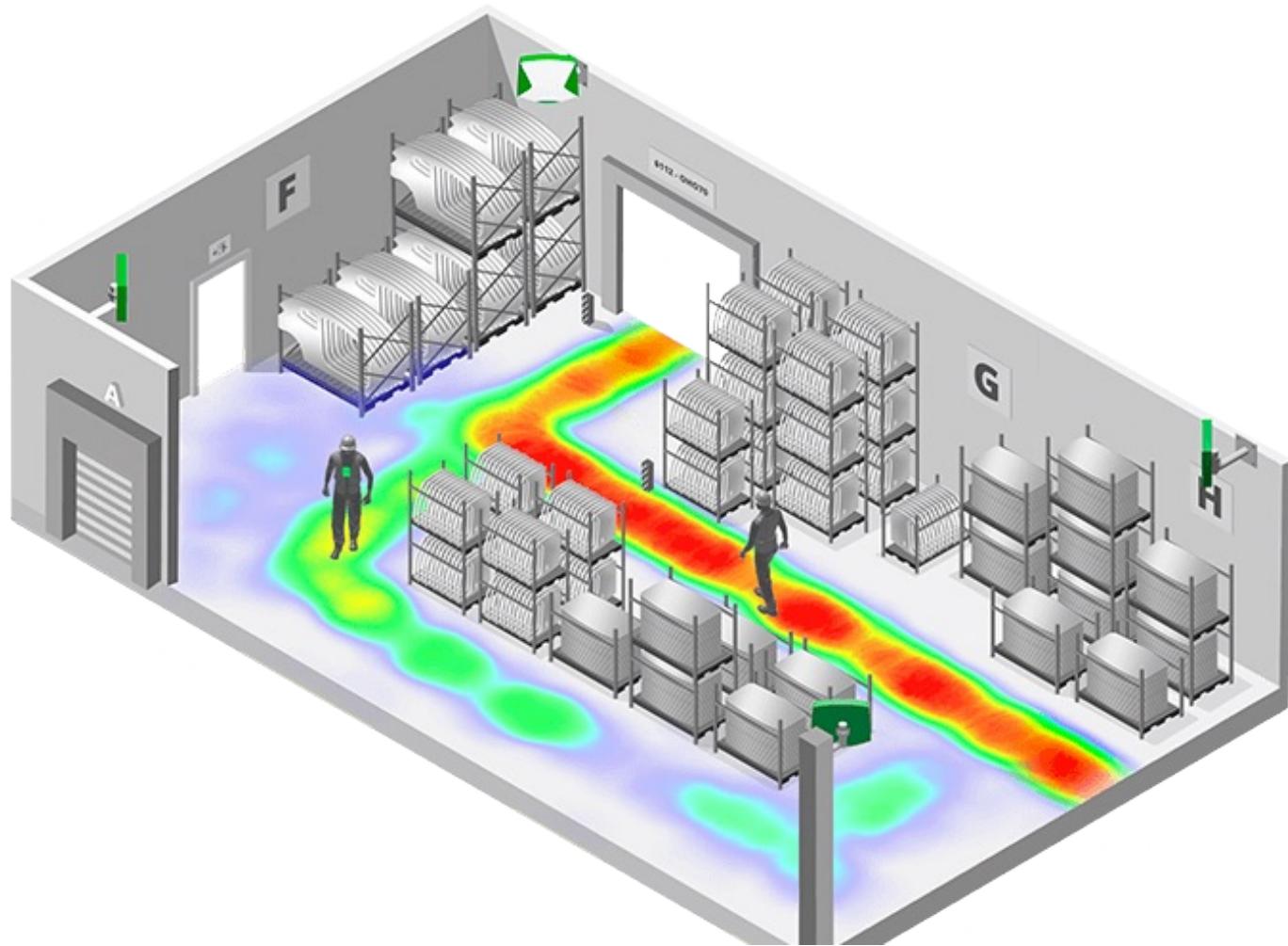
GPS





WiFi
Location
(Indoor)





Other Sensors

Flow sensor

